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# DRR Delivery Lessons not only for Children but also for Teachers: A Motivational Typology of Schools in DRR Education and Beyond

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**Abstract.** The purpose of this study is to develop a motivational typology of DRR Education in schools from the experience of delivering YUI Project's lessons to elementary schools in Japan since the Great East Japan Earthquake (March 11th, 2011), and to explore how the delivery class instructors communicate with schools (schoolteachers) with different motivations. Upon asking schoolteachers about the children and the school in preparation for the delivery of lessons, it has become clear that these prior tasks are not just for children, but also for schoolteachers. In this DRR counseling, how to communicate with the school will be changed by the motivations of the school. Three types of schools were considered (Progressive Schools, Ask-for-help Schools, and Just-feeling-the-trend Schools). The Ask-for-help School, for example, is highly motivated but does not know how to provide regular disaster education. In this case, we could (and in fact have) provide advice and support on the design of school DRR education, with the understanding that the schoolteachers are the main players in the education of school DRR. In the case of the just-feeling-the-trend school, on the other hand, the motivation is not so high, and the method is not well understood (and in some cases there seem to be no questions about how to develop school DRR education). In such cases, communicating with the school is still a major challenge. The challenge we have is how to approach schools that are not motivated or have low motivation, such as the just-feeling-the-trend school, and to develop a relationship with them encouraging school disaster education in the future.

**Keywords:** DRR Delivery Lessons, DRR Motivation, DRR Counseling

## 1 Introduction

### 1.1 The Great East Japan Earthquake and DRR Education in Japan

Not only structural measures but also non-structural measures must be developed for mitigating damage from the next natural disaster. The development of the non-structural measures has been in high demand since the Great East Japan Earthquake. In the disaster, the management responsibility of the school and the local government has been questioned with regard to injuries and damages at the school. DRR (Disaster Risk

Reduction) education and management in schools is now one of the top priorities in schools. School DRR Education is not unique to Japan, but is a worldwide concern, so the contents of this study should serve as a guide for school DRR education in other countries as well.

## 1.2 YUI Project and DRR Delivery Lessons

The YUI Project encourages DRR education in Japan, and has been doing so since the Great East Japan Earthquake (March 11, 2011) at the International Research Institute of Disaster Science (IRIDeS), Tohoku University. The YUI project has been providing DRR delivery lessons for developing children's DRR awareness. The number of schools visited (from the start of 2014 as of April 2022) is about 310, and the total number of participants is over 18,000.

This DRR lesson contains not only an activity in which the children move around and think on their own (i.e., a group activity), but also an activity in which they learn from the instructor about knowledge and attitudes related to disaster science (i.e., a lecture). Reflection time is included in addition to these activities, but is not reported here (See [1][2] for more detailed explanations).

The lecture promotes an understanding of the generality of the mechanisms underlying the occurrences of disasters, as well as an understanding of the individual nature of disasters, in that individual disasters can have varying consequences. As an understanding of generality, a 3D motion picture and an experimental clip are used to promote an understanding of the mechanism of disaster occurrence. The 3D motion, for example, is used to deepen understanding of the geography of Japan (there are four underground plates, and earthquakes occur at the boundaries of these plates). And also, the experimental clip is used for visual understanding of how a tsunami is different from a normal wave. As an understanding of individuality, on the other hand, to promote understanding of the differences among specific disasters (and damages) in the past, having students watch simulation videos of actual disasters that have occurred in the past. Along with watching these videos, the instructor explains the differences in the damage caused in each disaster.

In the group activity, the purpose is to encourage students to perceive disaster situations as their own by experiencing simulated decision-making and actions related to disasters. In this activity, the students are asked to imagine the situations that are expected to occur from the time a disaster occurs to the time they are living in an evacuation center, and to think about the decision-making and actions in each situation as group work (about 5 to 6 people). This activity is called the "DRR Stamp Rally". See [1] and [2] for more details.

Note that although recently it has been difficult to conduct face-to-face DRR lessons due to the COVID-19 pandemic, we are modifying lessons to make them equivalent to the above-mentioned practices. We, for example, have begun developing lessons using an online videoconferencing system (e.g., Zoom Meeting and Microsoft Teams) and video materials [3].

### 1.3 Framework and Purpose of the Study

Through the experience of the DRR delivery lessons so far, we have also come to believe that the delivery lessons are not only for children, but also for schoolteachers (and even more for schools). In other words, schoolteachers also learn how to give DRR lessons and how to behave in the classroom through the DRR delivery lesson.

In psychology, it has been pointed out that there is an aptitude-treatment interaction (ATI) in the relationship between teachers and learners [4-5]. ATI is the idea that there is no single teaching method that is best for all learners, and that the treatment (e.g., teaching method) that brings the best learning effect must be considered according to the aptitude of the learner. The learners' aptitudes include intelligence, learning style, motivation, knowledge, personality, interests, and attitude. The treatment, on the other hand, includes teaching methods, teaching materials, use of teaching tools and equipment, teacher characteristics, and classroom atmosphere.

Assuming that the target of the DRR delivery lessons is schoolteachers, aptitude corresponds to the knowledge, motivation, attitude, etc. of the school for DRR lessons. Among them, we believe that motivation varies greatly from school to school and can be categorized. To provide more effective DRR delivery lessons to each school, it is necessary to change the treatment of the lecturers according to the characteristics of the schools specific to each category. Therefore, it is important to conduct interviews with schoolteachers before carrying out DRR delivery lessons, and to conduct careful information exchange. We call this "DRR counseling" (The expression DRR counseling was inspired by the term "cognitive counseling," which refers to the idea of knowing the needs of children to provide appropriate interventions for their learning and studying [6]).

The purpose of this study is to report how we provide DRR counseling before delivery lessons, categorize the schools based on their motivation for DRR lessons, and discuss how the providers of the DRR delivery lessons need to prepare for each type of school.

#### 2.1 DRR Counseling before Delivery Lessons

The main purpose of DRR counseling is to understand the cautions and considerations to be taken during the delivery lessons. To avoid triggering the children's trauma, for example, no images or videos that might be emotionally stressful were used in the lessons given in the early days after the disaster. Instead, the delivery lessons dealt with content related to the earth and nature, and based on scientific facts, as described above. Lessons continue to be held in the form of communicating scientific facts today (SY 2022-2023). This is because the schoolteachers inform us that some children still need to be given mental care. In the years of experience with these pre-counseling procedures for delivery lessons, it has been clear that the counseling often includes advice and support for the schoolteachers. For example, schoolteachers were given advice on how to conduct their usual DRR education as well as how to discuss the recent DRR management in school. These counseling activities could vary according to the type of school, and sometimes continued even after the delivery lessons.

## 2.2 DRR Counseling for School Education

Schools provide disaster education with various degrees of motivation and through numerous methods. Counseling has also been done for schools (and for schoolteachers). Never losing the premise that schoolteachers are the main players in school DRR education, advice and support have been provided with sufficiently monitoring the characteristics of the schools (e.g., the damage caused by the disaster, geographical conditions, etc.). The approach has been customized for each school, based on the degree of motivation and the type of school.

In the following section, we provide a categorization of the motivational typology and then explain, along with examples, an experience-based approach for communicating with the schools according to the school types.

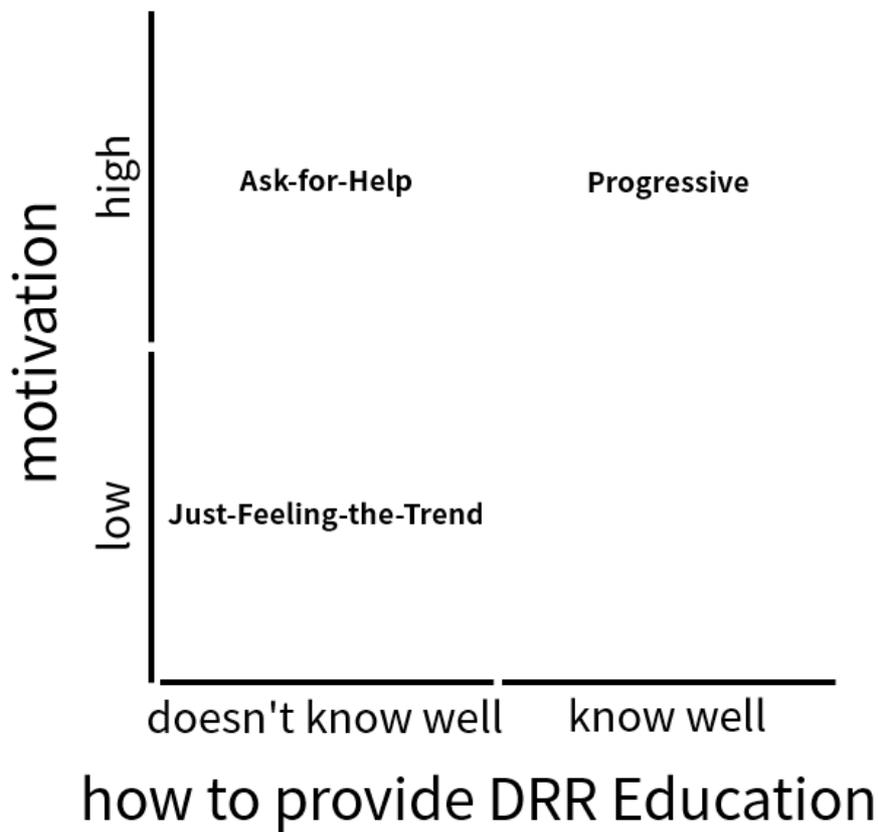


Fig. 1. Motivation typology of schools in DRR Education.

### 3.1 Abstract of a Motivational Typology of Schools

Three types of schools were considered. **Fig. 1** describes the motivation typology of schools in DRR Education. The vertical axis represents motivation, and the horizontal axis represents how to provide DRR education. A progressive school is placed at the intersection of high motivation and knows well how to provide DRR Education. An ask-for-help school is placed at the intersection of high motivation and doesn't know well. A just-feeling-the-trend school is placed at the intersection of low motivation but doesn't know well how to provide DRR education.

**Progressive School.** A progressive school is highly motivated for school disaster education and has a good understanding of how to conduct the education. It is, for example, a school that seeks to actively engage in school DRR education (e.g., UNESCO schools), and that participates in a national conference.

**Ask-for-Help School.** An ask-for-help school is highly motivated, but does not understand enough about how to conduct school DRR education, nor does it fully understand what kind of practice should be provided on a daily basis. It is, for instance, a school where the principal is leading the schoolteachers to work hard on the DRR education, or a school that has been designated by the local government for the practice of disaster education.

**Just-Feeling-the-Trend School.** A just-feeling-the-trend school has low motivation and does not know how to provide school DRR education. As an example of this school, other neighboring schools may have experienced the YUI Project delivery lessons, so the school applies for the lessons too. They also think that the class is socially necessary, so they feel that they would like to conduct DRR education.

### 3.2 DRR Counseling with Schools Depending on Types of Motivations

These three categories lead to different approaches to communicating and counseling with schools. In a progressive school, schoolteachers are engaged in disaster education in a number of diverse efforts. Rarely does it offer advice or assistance on the practicalities of the education. However, questions and concerns may be raised about recent findings in disaster science and the latest predictions of natural disasters, so advice and assistance from these perspectives is needed. In an ask-for-help school, careful DRR counseling should be provided to schoolteachers in charge of school DRR education. It is essential, for example, to introduce examples of what kind of practices are available and explain what should be considered when applying the practices. Note, however, that a large burden on schoolteachers must be avoided and long-term involvement is required to give them experience in the practice of the school DRR education. In a just-feeling-the-trend school, there is some overlap with the ask-for help school. We expect to do things like introducing a case study, but in many instances, communication and counseling are not successful because the motivation is not as high as it could be. Below, cases concerning a progressive school and an ask-for-help school are described.

**Progressive School.** We introduce school X as a progressive school. Schoolteachers at this school were already passionately working to provide DRR education to students. One of the greatest achievements of school DRR education was to have children produce their own disaster prevention booklets (containing a disaster prevention map) and hand them out to the local community. The schoolteachers had provided lessons to develop the children's DRR awareness in a variety of ways leading up to the creation of the final product. One of the ways they did this was to go back to the history of disasters in the area of the school district based on a past document (an old written description of a volcanic eruption of a mountain) in order to help children understand that even though there were no disasters in the recent past, there had been disasters in the distant past. In this series of experiences, the visiting lecturer only provided advice and support when requested, but the school was actively and voluntarily carrying out their own DRR education. This school's program has been presented at an event on disaster science (i.e., the Sendai BOSAI Forum).

**Ask-for-Help School.** School Y is an ask-for-help school. This school asked the lecturer to help them design a DRR drill after the delivery lesson at the school was finished. The story behind the assistance was a request from the school principal (who was posted to the school in the year in which the request was made) who wanted to enhance DRR awareness in the school and the local community (since the school and the local community had not suffered significant damage from the Great East Japan Earthquake and therefore had low awareness of DRR). It was designed by a team lead by the vice principal and the chief DRR teacher, with assistance from the instructor. School Y is located in an inland residential area. The safety evacuation area (*hinan basyo* [in Japanese]) and the evacuation shelter (*shitei hinanjyo* [in Japanese]) were separately located at the elementary school (School Y) and a junior high school, which was located nearby. Considering that the evacuation area and the evacuation shelter are located in different places as described above, it was decided that a DRR drill would be implemented with not only the elementary school, but involving the junior high school and the local government (in this case, a civic center staff) as well. This was decided because it is considered to be more effective to conduct evacuation training at an evacuation area immediately after a disaster, and at the evacuation shelters a while after a disaster. In the design of this DRR drill involving both the elementary and junior high school, a stamp rally produced in the YUI project was also used, which can be carried out with parents and children.

**Just-Feeling-the-Trend School.** We will not single out one school as an example of a just-feeling-the-trend school. In many cases, these schools simply hold a delivery lesson, and we rarely have a subsequent relationship with them. This tendency is particularly due to low motivation. As the old expression "*You can lead a horse to water, but you can't make him drink*" goes, how to motivate them and get them to develop school DRR education is a big challenge, although it might be beyond the role of delivery lecturers. As described above, different types of motivation in schools change the way we interact with them.

This study developed a motivational typology of DRR Education. Three types of schools were considered (progressive school, ask-for-help school, and just-feeling-the-trend school). As discussed above, the level of motivation requires a different way to communicate with each school.

#### 4.1 Future Directions of DRR Delivery Lessons and Counseling

Eleven years have passed since the Great East Japan Earthquake, and with the COVID-19 pandemic, how we interact with schools has changed. This section will discuss the future direction of DRR delivery lessons and counseling.

**Difficulties in Providing DRR Delivery Lessons.** It is generally believed that people's awareness of DRR declines with the passing of time since a disaster, and we can imagine that people's awareness of DRR education also declines. Is the Great East Japan Earthquake an exceptional case? It would be hasty to make any conclusions here. However, the spread of COVID-19 has restricted many school activities, including DRR education. In fact, the number of DRR delivery lessons under the YUI Project has not yet returned to the level prior to the pandemic, even though some implementation efforts have been made. Due to the pandemic, new delivery lessons have been provided in the past two years.

**Providing DRR Delivery Lessons and Counseling.** We did not fully introduce the new lessons to prevent the spread of COVID-19 (see detail in [3]). The lessons are presented remotely and have a different element compared to the lessons of the past, but it is not a bad one. It rather indicated some good points than the former lessons. Meanwhile, no replacement for DRR counseling has been provided to date. The DRR counseling is now provided by email or telephone prior to lessons, but we feel that the quality and quantity of this counseling is not sufficient compared to what it was previously. It is necessary to explore the reasons for this, as well as to find a better way to provide DRR counseling remotely.

**Potential of Current Remote and Digital DRR Delivery Lessons.** The conventional face-to-face delivery lessons, which depend completely on the lecturer, have sometimes left the responsibility of DRR education up to the lecturer. The digital and remote DRR delivery lesson, in contrast, could be expected to lead to schoolteachers' active participation leading to them having a sense of responsibility for DRR education, and to increase or change schoolteachers' awareness of DRR education.

Based on this experience, conducting DRR delivery lessons that involve schoolteachers in various settings may change not only children's but also schoolteachers' motivation and awareness. The idea that delivery lessons are also effective in terms of raising and changing schoolteachers' DRR motivation and awareness would not alter, whether the lesson is given remotely (while the COVID-19 pandemic) or in-person (after the pandemic). Future research is needed to change the teacher's motivation by the DRR delivery lessons.

## 4.2 Limitations

Two limitations should be considered. First, this study did not survey schoolteachers, and therefore did not examine or provide a link between their needs for delivery lessons or instructors. A survey of schoolteachers should be carried out in the future to elaborate on the discussions.

Second, the study has named and defined schools' motivations for DRR education, but the appropriateness of those names and definitions cannot be fully determined with the present study. Further study will be required to develop more appropriate terms and definitions, referring to relevant studies on the general theory of motivation.

## 4.3 Concluding Remarks

This study developed a motivational typology of DRR Education. Three types of schools were considered. The level of motivation requires a different way to communicate with the school. In closing, we would like to address what the instructors cherish about working with schools. In DRR education at schools, the lecturers are engaged only for a very short period of time. We would like to approach their practices as a supporter with full respect for the schoolteachers, and without any negativity toward their practices. Schoolteachers are always the main players in school DRR education. We will continue to explore what we can accomplish for them to achieve a satisfactory education, as an external lecturer as well as a faculty member of the university.

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## References

1. Yasuda, M., Muramoto, T., & Nouchi, R. Assessment of educational methods for improving children's awareness of tsunamis and other natural disasters: Focusing on changes in awareness and regional characteristics in Japan. *Geosciences* 8(2), 47 (2018).
2. Yasuda, M., Saito, R., & Muramoto, T. Sustainability of disaster preparedness education effects in elementary school children and its diffusion effects on families: A comparison between coastal and inland schools. *Journal of Japan Society for Natural Disaster Science* 40, 125-142 (2021a).
3. Yasuda, M., Saito, R., Horita, T., & Muramoto, T. Case studies of DRR (Disaster Risk Reduction) delivery lessons using ICT in elementary school classroom in Japan – Lessons from COVID-19 to future practices. The 11th IIAI International Congress on Advanced Applied Informatics (2021b).

4. Cronbach, L. J. The two disciplines of scientific psychology. *American Psychologist*, 12, 671-684 (1957).
5. Snow, R. E. Aptitude-treatment interaction as a framework for research on individual differences in psychotherapy. *Journal of consulting and clinical psychology*, 59(2), 205-216 (1991).
6. Ichikawa, S. Introduction and Perspective of Cognitive Counseling. *Japanese Psychological Review*, 32 (4), 421-437 (1989).